Intel® Pro Wireless Display

Deployment Guide for Limited Proof-of-Concept in Enterprise

January 2014

Revision 1.1

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Revision History

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1.0	27Jan/2014	Initial release.
1.1	29/Jan/2014	Updated legal information.

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1 Introduction to Intel® Pro Wireless Display

As of writing (Jan 2014) Intel® Pro Wireless Display (Pro WiDi) technology is not yet intended for broad deployment into production at an enterprise. However, enterprises are increasingly aware of the benefits of Intel® WiDi and want to take advantage of these capabilities in the workplace. However, consumer and enterprise requirements are very different. Companies typically have more stringent demands for data security, and often must comply with regulatory requirements to protect sensitive information. An unsecure wireless connection to a projector or television might create unwanted risk. Businesses also have to consider life-cycle management and scalability when deploying technologies like WiDi. Intel® Pro WiDi) builds on the capabilities of Intel® WiDi and provides business with the tools and technologies to bring this capability to the enterprise. This document is intended to guide you through the process of performing a limited pilot of Intel® Pro WiDi technology.

1.1 Target Audience

This document is intended for IT administrators and professionals planning to evaluate Intel Pro WiDi in a limited Proof-of-Concept (POC) environment within an enterprise.

1.2 Intel® Wireless Display versus Intel Pro Wireless Display

Intel® Wireless Display (Intel® WiDi) technology allows users to wirelessly connect to certified Intel WiDi receivers, such as large screen monitors and projectors. The Intel application utilizes Intel graphics and WiFi components to deliver Blu-Ray* and gaming quality and performance without wires in the living room. The Intel Pro WiDi user experience, as shown in the graphic below, is enabled when Intel WiDi software (starting with version 4.2) is installed on an Intel® vPro™ technology system and then connects to an Intel Pro WiDi certified receiver. Intel WiDi is a Miracast* solution with premium performance enhancements based on Intel technologies.

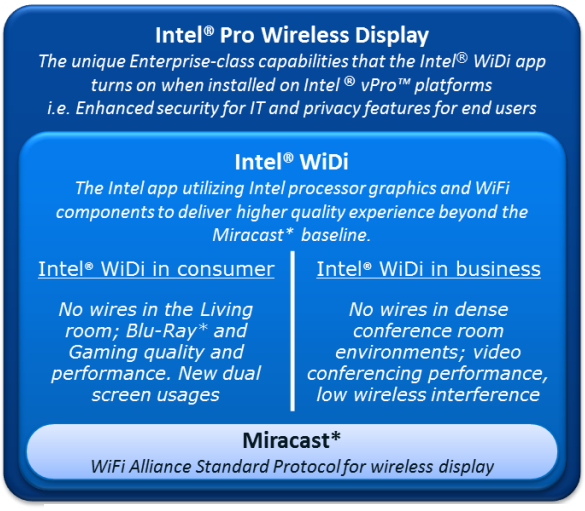

Intel® Pro Wireless Display
The unique Enterprise-class capabilities that the Intel® WiDi app turns on when installed on Intel ® vPro™ platforms
i.e. Enhanced security for IT and privacy features for end users
Intel® WiDi
The Intel app utilizing Intel processor graphics and WiFi components to deliver higher quality experience beyond the Miracast* baseline.
Intel® WiDi in consumer
No wires in the Living room; Blu-Ray* and Gaming quality and performance. New dual screen usages
Intel® WiDi in business
No wires in dense conference room environments; video conferencing performance, low wireless interference
Miracast*
WiFi Alliance Standard Protocol for wireless display

Figure 1: Intel Pro WiDi vs. Intel WiDi

Intel vPro technology PCs are an essential component for Intel Pro WiDi but for clarity it is worth noting that it is not required that Intel® iAMT (Intel Active Technology Management) is activated or enabled on the target PCs.

1.2.1 Client Operating System

It is recommended that the POC be run on Windows* 7 PCs.

As of writing (Jan 2014) Intel Pro WiDi features on Windows 8 and Windows 8.1 are still under development.

Note that the Intel WiDi application needs to be installed on Windows 7 and Windows 8.0 PCs but this application is not to be installed on Windows 8.1. The WiDi functionality has been replaced by a "Project" option on the "Devices" charm on the Windows 8.1 UI.

1.2.2 Intel Pro WiDi Usages

The experience of using Intel Pro WiDi will be different depending on the client (laptop or mobile device) and the receiver (adapter, projector, or display) being used. Figure 2 below is useful in determining what capabilities you can include in your POC test plans.

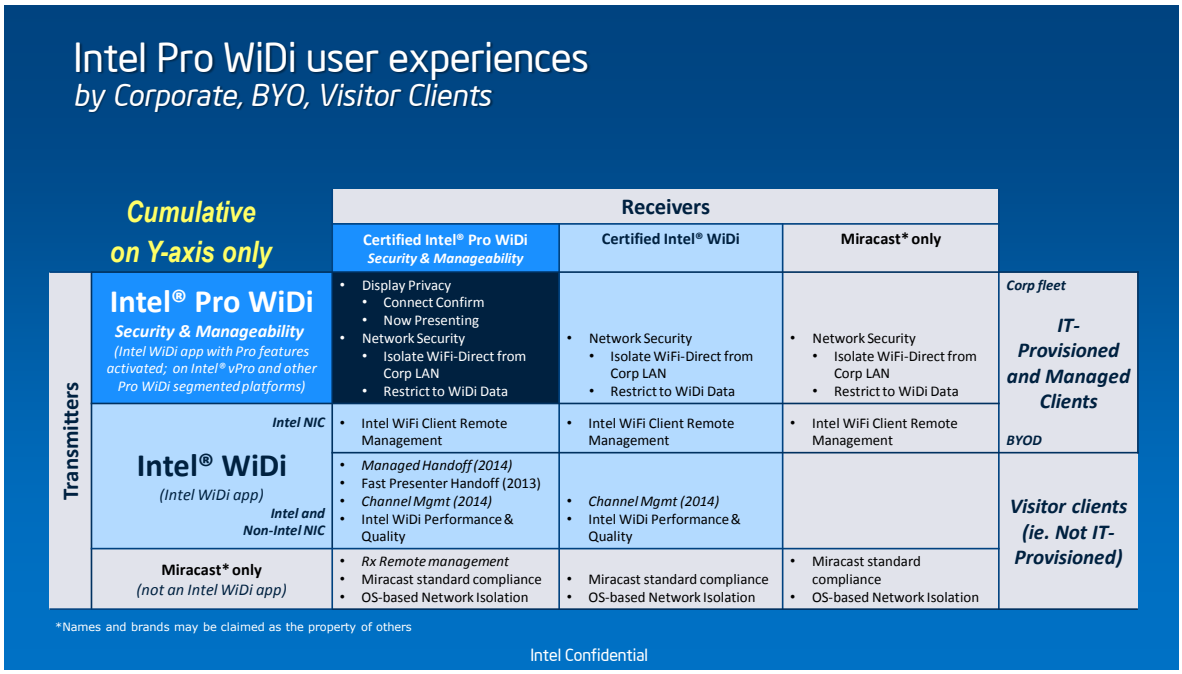


Figure 2: Intel Pro WiDi user experience based on transmiter and receiver infrastructure

Until version 4.2, Intel WiDi (based on Miracast) had been developed for consumer environments where the optimum user experience is to quickly connect with as little interaction as possible, and to block any other user from accessing a display once a user has connected. The security requirements are not as stringent as required in enterprise as

the connection is simply for displaying content, which is usually not of a confidential nature (e.g. photos, movies and games). In most cases the displays are far enough away from public spaces that the wireless connection may not be intercepted. All day battery life is not as critical in a living room or home entertainment environment, so for consumers, Intel optimizations are positioned for their quality and performance improvements.

Table 1 below lists the features enabled when an Intel vPro technology platform is used with an Intel Pro WiDi certified receiver.

Table 1. Intel Pro WiDi Features with a Pro WiDi Certified Adapter

User Experience	• **Connect Quickly** within 12 seconds.
	• **Panel Self Refresh** optimizes bandwidth usage; saves battery life by allowing the transmitting client to transmit image data only when display buffer data has changed.
	• **Fast Presenter hand-off** - Next waiting presenter connects quickly, if previously paired with the WiDi receiver in use.
	• **Privacy features**
	  ○ **"Now Presenting" indicator** reminds the user that they are connected and sharing their display content with a wireless display.
	  ○ **Visual confirmation before content display** provides a way to confirm that the user is connected to the wireless display in their room and not an adjacent room.

Security	• **Isolate WPANs** - Blocks bridging to corporate WLAN. • **Restrict WPAN to WiDi -** Prevent PC-to-PC access to data via WPAN.
Manageability	• **Manage Remotely** – Manage clients via Intel WiFi IT Admin Tool; Manage receivers via SNMP, telnet/CLI, or HTTP. • **Limit network bandwidth** – Limits bandwidth used for display with a particular Pro WiDi receiver by restricting client connections to 720p resolution. • **Identify WiDi Receivers in the Environment** - Name receivers and customize receiver splash screens.
Regulatory	• **DFS Roaming** – When DFS Roaming is enabled and the client is connected to a DFS channel, the client automatically switches to a non-DFS channel, if available.
Additional Features	• **Adapter standby** – The adapter for Intel ProWiDi should go into a standby state after 30-60 seconds when not connected to a client. In the standby state, the display device should be blank.

2 Intel Pro WiDi Requirements

This chapter defines the overall requirements for implementing Intel Pro WiDi. Additional requirements information may be included in the setup sections for individual components.

2.1 Overview

Intel Pro WiDi consists of several components, all of which are required to experience the full benefits of Intel Pro WiDi. As of writing, there are no Pro WiDi adapters available on the market so while an end-to-end POC incorporating the adapter-side features of Pro WiDi may not be possible, this document will comprehend what a full POC could look like, while calling out what can actually be tested.

The illustration below provides a high level visual overview of the deployment topology for end to end testing of Intel Pro WiDi.

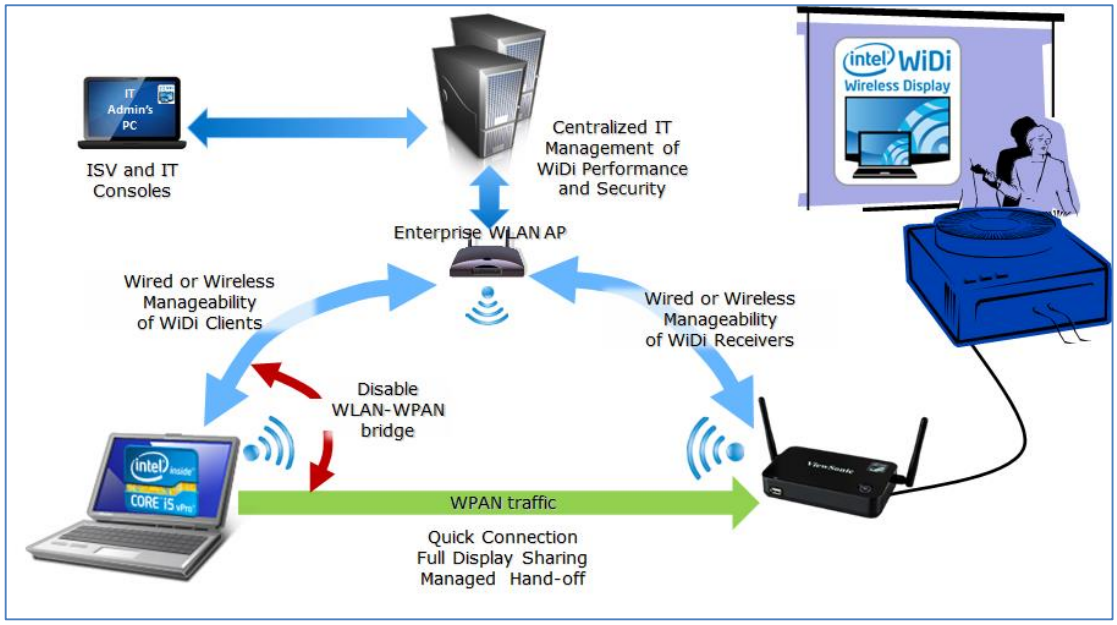


Figure 3: Intel Pro WiDi Depolyment Topology

2.2 Adapters for Intel Pro WiDi

As mentioned earlier, Intel Pro WiDi adapters are not yet available on the market. However, Intel is working with Adapter, TV and Projector OEMs and has defined some of the features expected to be present in a "Pro" display device. That said, Intel cannot make guarantees with respect to OEM device features or availability. For the purposes of this document, the features outlined will reflect what Intel expects a "Pro" device to support.

2.3 Infrastructure Requirements

2.3.1 IT Department

The IT Department requirements are as follows:

- **Updated Intel graphics drivers and Intel WiFi drivers**: IT must install updated graphics drivers and Intel Pro WiDi drivers on all client computers.
- **Intel WiDi application**: IT must install the Intel WiDi application on all client computers (except those on Windows 8.1)
- **Intel WiDi session logging**: we recommend turning on logging in case there is an issue that is difficult to reproduce (refer to section 8.1 for instructions).

IT needs to identify users that are prepared to test and report on their experiences with Intel WiDi. It will be important to manage expectations with this group of users.

2.3.2 Conference Room

The requirements for the conference room are listed below.

- **Projector or display with VGA or HDMI input ports**: depending on the adapter in use Intel Pro WiDi can connect to the display unit via VGA or HDMI.
- **A/C power**: the adapter must be plugged into an A/C power outlet.
- **Network connection**: "Pro" manageable adapters may require a RJ45 interface for the management connection (firmware updates, etc.).

2.4 Client System

Intel Pro WiDi is enabled through the following Intel software components:

- Intel WiDi software
- Intel® HD Graphics Driver
- Intel PROSet/Wireless Driver with Intel® My WiFi Technology (Intel® MWT) enabled

Note that is it possible to utilize OEM Graphics and Wireless drivers and have Intel WiDi display on a display device, but that Intel recommends the use of the latest Intel HD Graphichs and PROSet/Wireless drivers.

2.4.1 Supported HW / Platforms

Intel Pro WiDi 4.2 64-bit and 32-bit requires an Intel® vPro™ Personal Computer (PC) configured with one of the Intel supported configurations shown in Table 2 and Table 3.

Table 2. Intel Pro WiDi Supported PC Configurations

Processors	• 3nd Generation Intel® Core™ processor family: - All Intel® Core™ i3, Intel Core i5, and Intel Core i7 processors (Mobile and Desktop) • 4th Generation Intel® Core™ processor family: - All Intel® Core™ i3, Intel Core i5, and Intel Core i7 processors (Mobile and Desktop)
Graphics Controller	• Intel® HD Graphics 2nd Gen Core Mobile • Intel HD Graphics 3rd Gen Core Mobile and Desktop • Intel HD Graphics 4th Gen Core Mobile and Desktop
Chipsets	• Intel® 6 Series Express Chipsets - Mobile Intel Q67/Q65/B65/Z68/H67/H61/QS67/QM67/HM67/UM67/HM65 Express Chipsets • Intel® 7 Series Express Chipsets - Desktop/Mobile QS77/QM77/HM77/UM77/HM76/HM75/Q77/Q75/B75/Z77/Z75/H77 Express Chipsets • Intel® 8 Series Express Chipset - Desktop/Mobile Q87/QM87/HM87/HM86 Express Chipsets

Table 3. Intel® Centrino® Wireless Hardware Requirements

Dual-Band Adapters (2.4GHz & 5GHz)	**Single Band Adapter (2.4GHz)**
Intel Centrino Ultimate-N 6300	Intel Centrino Wireless-N 2200
Intel Centrino Advanced-N + WiMAX 6250	Intel Centrino Wireless-N 2230
Intel Centrino Advanced-N 6230	
Intel Centrino Advanced-N 6205	
Intel Centrino Advanced-N 6235	
NOTE: The Intel Centrino Advanced-N 6230 adapter only supports Mobile. All others support Mobile and Desktop.	

2.4.2 Operating Systems

As mentioned previously, Pro WiDi features will run on Windows 8 and 8.1 but for an enterprise POC we recommend using one of the Windows 7 operating systems listed below.

- Windows 7 Home Premium / Ultimate / Professional-Enterprise / Home Basic 64-bit and 32-bit editions

Table 4. Intel Pro WiDi Features Supported by Windows 7

Intel Pro WiDi feature	**Operating System version**
	Windows 7
"Now Presenting" indicator	Task bar icon background is highlighted in green while connected

Intel Pro WiDi feature	Operating System version
	Windows 7
Confirm before Display	Supported
PIN required on every connect	Supported
Fast Handoff (a.k.a. Presenter Eviction)	Supported
Network Security: Isolation (WPAN-to-WLAN bridge blocking)	Supported by Intel PROSet and by OS policy
Network Security: Restrict to WiDi on WPAN	Supported by Intel PROSet only
Remote Management of WiDi client SW	Use either of the following: • Intel PROSet and IT-selected software distribution/fix solution (e.g. BigFix, Microsoft* System Center* Configuration Manager (Configuration Manager), etc.) • Remote management via Active Directory and Microsoft GPOs (does not provide management of "Restrict to WiDi" policy)

2.4.3 Windows 7 Required Configuration

- Microsoft* Windows 7
- 3rd Generation Intel Core processor (see Table 2 for a complete list of supported PC configurations)
- Intel Pro WiDi requires Microsoft* .Net 4.0 Framework
- Intel HD Graphics Driver Release 9.18.10.3310 or above
- Intel PROSet Wireless Driver Release 15.9.1.2 or above
- Intel WiDi application version 4.2.21.0 or above

It is recommended that you use the configuration checking tool at the Intel® Wireless Display site (http://intel.com/go/WiDi under "Get Software and Driver Updates") to check your configuration and download the latest drivers and applications.

***Note**: All Intel software and drivers are available from Intel Validation Internet Portal (https://platformsw.intel.com).*

3 Infrastructure Considerations

This chapter contains some points to consider before deploying Intel Pro WiDi for the pilot.

3.1 WiFi-Direct

You must enable WiFi-Direct in your environment. See Chapter 6.

3.2 Using Intel Pro WiDi with a VPN

Depending on your infrastructure settings, you may need to connect to WiDi before initiating a VPN connection.

3.3 DFS Considerations

For regulatory reasons, Intel Pro WiDi does not operate on WiFi channels reserved for radar use (also known as "DFS channels").

To avoid potential use of a DFS channel, you may enable DFS roaming using the Intel PROSet IT Admin Tool. When DFS roaming is enabled and the client system is currently connected to WLAN using a DFS channel, the client attempts to 'roam' and locate the same SSID on a different channel. If successful, the client connects to the WLAN and WiDi using the new channel. If not, Intel Pro WiDi displays an error message and does not connect to the wireless display.

If your WLAN is enabled for using DFS channels, as a temporary solution, you may need to do one of the following to accommodate the pilot:

- Turn off 5 GHz on the client
- Disable DFS on the WAPs near the Rx
- Add a non-DFS WAP near the Rx

3.4 Intel Pro WiDi and WiFi Interaction

When a WiFi-enabled PC comes within range of a WiFi access point, it initiates a WiFi connection before it can create an Intel Pro WiDi connection. Since Intel Pro WiDi can only connect using the same channel and band that the WiFi connection uses, the WiFi connection may impact performance by creating additional traffic on the network.

4 Display Adapter Setup

Until Intel Pro WiDi Certified Adapters are available, POCs will need to be run using an adapter designed for the consumer market. There are a number of adapters, TVs and projectors that support Intel WiDi but we strongly recommend using an adapter that has recent firmware available to ensure your POC is as effective as possible.

Some adapters to consider are the ActionTec ScreenBeam Pro (which has Gen4 firmware available) and others on Gen3 firmware include the Viewsonic WPG-370, the Netgear PTV-3000 and the IOGear GWAVR as well as two projectors from Dell, the M900HD and the S520.

4.1 Physical Adapter requirements

The Intel WiDi adapter will require an A/C power source and either a VGA or HDMI connection to the display device. Pro WiDi manageable adapters may also requie an RJ45 connection for remote manageability.

Specific implementations of the VGA and HDMI interfaces on display devices will vary. For example, connection auto-sensing and timeout behavior when connected to a WiDi adapter may need to be characterized before initiating the POC and may even be specific to the wiring within particular conference-rooms. Conference-room switchgear, repeaters and signal adapters in the VGA or HDMI path can also affect the success of the POC. It should be decided if sound is to be included in the scope of the POC.

It is important to realize that once a WiDi session is established and active, Intel® Pro WiDi encrypts the data stream creating a secure tunnel between the client and WiDi adapter. However, if no session is established it is possible for anyone with a WiDi-enabled client and line-of-sight to the display to establish a session and stream their own content. This limitation makes the consumer versions of WiDi unacceptable for use in public areas.

5 Client Setup

This chapter describes how to set up the client platforms to deliver the Intel Pro WiDi remote display user experience. This is a "Best Known Configuration" that describes the intended outcome of the client setup process. When you have completed the client setup process, you should have a client system that is configured with the "Best Known Configuration."

5.1 Installing the WiDi Software Stack

This section describes how to install Intel Pro WiDi and the required device drivers on the client system(s).

Note: *It is best practice to remove any previous versions of WiDi software, Intel PROSet/Wireless software, and the Intel HD Graphics Driver on the client before installing the new software stack.*

Note: *For best results the drivers and software* must *be installed in the following order:*

1. *Intel HD Graphics Driver.*
2. *Intel PROSet/Wireless Software with Intel My WiFi Technology (Intel MWT).*
3. *Intel WiDi Software.*

Step 1: Install Intel HD Graphics Driver

Install the Intel HD Graphics Driver by following the steps below. To perform this step you must have administrative rights to the client system and have installed the platform software components previously defined in the guide. **Navigate to the drive and directory location containing the Intel HD Graphics Driver installation files and double click** Setup.exe**.**

After the client system reboots, the graphics driver installation is complete.

Step 2: Install Intel PROSet Wireless Software

Install the Intel PROSet/Wireless Software with Intel MWT by following the steps below. To perform the steps in this section, you must have administrative rights to the client system and have installed the platform software components previously defined in the guide. Your installation should closely resemble the example below.

Navigate to the drive and directory location containing the Intel PROSet Wireless installation files and double click Autorun.exe**.**

Step 3: Install Intel WiDi Application

This section describes how to install the Intel WiDi application on the client system(s).

Notes:

1. *Both the Intel HD Graphics Driver and the Intel PROSet/Wireless Driver MUST be installed prior to installing Intel WiDi software to meet platform detection requirements in the Intel WiDi software.*

2. *Intel WiDi requires Microsoft .Net 4.0 framework to be installed prior to installing the WiDi application.*
3. *To perform a large-scale batch install using a script, see Section 5.2.*

The Intel WiDi software release is a single-file-based installer. Install the software as follows: Copy the Intel WiDi **Setup.exe** file to an accessible drive. The file doesn't have to be on the PC hard drive but must be an accessible drive that is writable so the installation files can be extracted. For example, CDROM disk installs are not supported.

Depending on your firewall rules you may need to configure your firewall to allow WiDi traffic.

5.2 Intel WiDi Software Command Line Installation Switches

To perform a larger scale "batch" install using a script, use the information in this section.

5.2.1 Silent Installations & Uninstall

Silent install and uninstall modes for the Intel WiDi software are used to run the `setup.exe` from the command line, in a non-verbose mode, with all default options selected and all licenses accepted.

- Install Command line: `setup.exe /s /v/qn`
- Uninstall command line `setup.exe /x /s /v/qn`

5.2.2 Desktop Shortcut

Desktop Shortcut is used to enable or disable the creation of a desktop shortcut for all users.

- Command line: `setup /v"WIDIAPP_DESKTOP_SHORTCUT=x"`
- Enable: `setup.exe /v"WIDIAPP_DESKTOP_SHORTCUT=1"`
- Disable: `setup.exe /v"WIDIAPP_DESKTOP_SHORTCUT=0"`

5.2.3 Help

Help is used to display the supported command line options:

- Command line: `setup.exe /v/help`

5.3 Uninstalling Intel WiDi Software

Note: *Perform this procedure only to uninstall Intel WiDi software if the installation process was successful. If the install procedure was unsuccessful, you do not need to uninstall it.*

To uninstall Intel WiDi software, do the following:

1. Go to **Start** > **Control Panel** > **Programs and Features**.
2. Select **Intel WiDi**.
3. Select the **Uninstall** option to uninstall the Intel WiDi.
4. Reboot the system to complete the uninstall process.

5.4 Configuring the Video Resolution

Use the steps below to set the screen resolution to one of these supported resolutions:

- 1280x720
- 1280x768
- 1280x800
- 1366x768
- 1440x900
- 1600x900
- 1920x1080 (preferred)

1. Establish an Intel WiDi session with the adapter.
2. Right-click on the desktop and select **Screen Resolutions**.
3. Select the preferred resolution, 1920x1080, if supported.

Note: *The resolution is retained by the graphics driver on all subsequent Intel WiDi sessions until it is changed.*

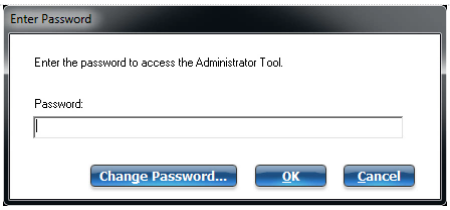
6 Creating a WiFi Settings Package

Creating a WiFi policy script for the client PC requires the Intel WiFi driver and Intel PROSet Administrators Toolkit to be installed. During the installation, select the **Customize** button and select all options on the next screen. Follow the installation instructions in Section 5.1, Step 2: Install Intel PROSet Wireless Software.

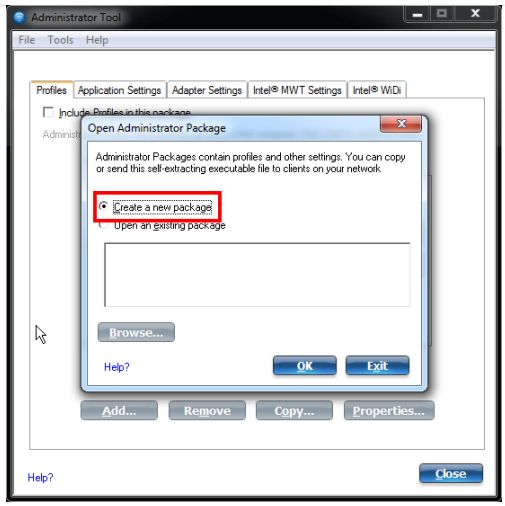
Note: *Perform the steps below on an IT Administrator computer, not on a client computer. The sequence below reflects the dialog as run on a Windows 7 PC*

1. Click the Windows Start button and click **All Programs.**
2. Scroll to "Intel PROSet Wireless" folder and double-click **WiFi Administrator Tool** to launch the Toolkit.

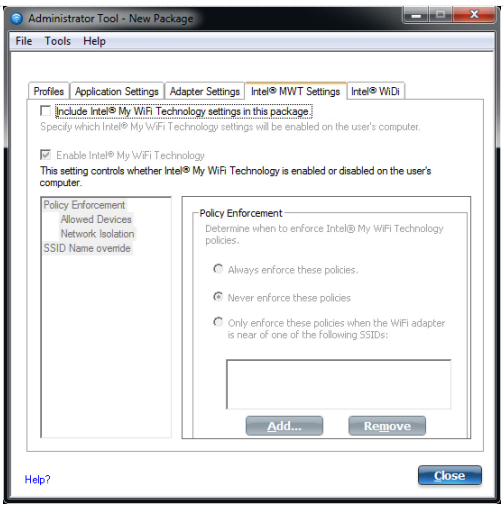
   The Enter Password dialog is displayed.



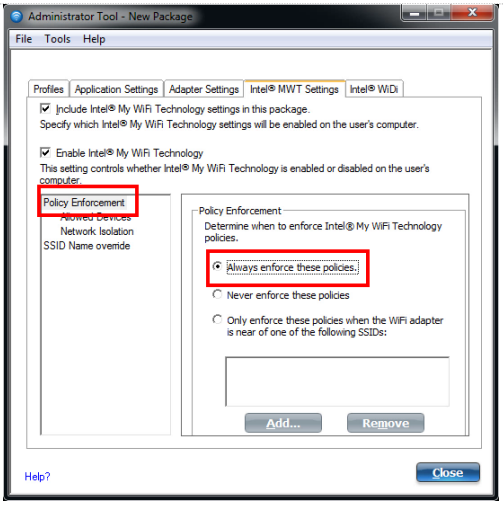
3. Create a password to protect the administrator profiles from non-Administrator users. Create a password of your choice that you can remember and click **OK**. In the Open Administrator Package dialog, select **Create a new package**, and click **OK**.



4. In the Administrator Tool – New Package window, select the **Intel® MWT Setting** tab to define your Intel MWT policy options.
5. Select **Include Intel® My WiFi Technology settings in this package**, and select the Enable **Intel® My WiFi Technology**. The lower right Intel MWT policy options window becomes active. You can allow or disallow Wireless LAN and Wireless PAN bridging on client PCs as required for your IT security to prevent data traffic between Intel MWT and other network interfaces. (For example, no internet sharing will be possible.)

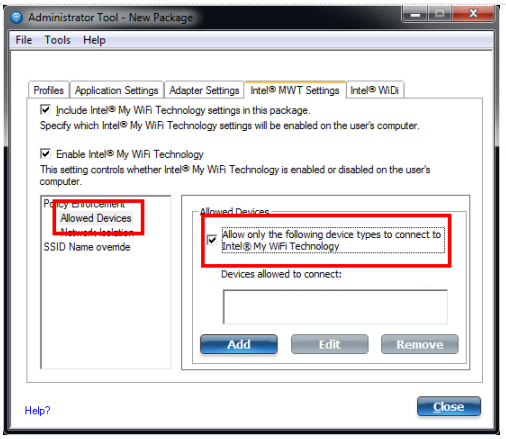

Administrator Tool - New Package
File Tools Help
Profiles Application Settings Adapter Settings Intel® MWT Settings Intel® WiDi
Include Intel® My WiFi Technology settings in this package
Specify which Intel® My WiFi Technology settings will be enabled on the user's computer.
Enable Intel® My WiFi Technology
This setting controls whether Intel® My WiFi Technology is enabled or disabled on the user's computer.
Policy Enforcement
Allowed Devices
Network Isolation
SSID Name override
Policy Enforcement
Determine when to enforce Intel® My WiFi Technology policies.
Always enforce these policies.
Never enforce these policies
Only enforce these policies when the WiFi adapter is near of one of the following SSIDs:
Add...
Remove
Help?
Close

6. In the left pane, select **Policy Enforcement**. In the right pane, select **Always enforce these policies**.

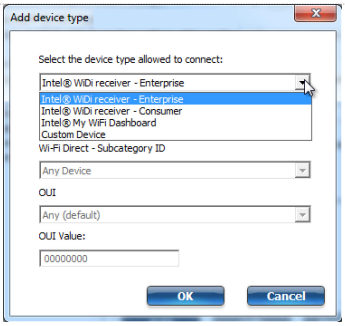

Administrator Tool - New Package
File Tools Help
Profiles Application Settings Adapter Settings Intel® MWT Settings Intel® WiDi
Include Intel® My WiFi Technology settings in this package.
Specify which Intel® My WiFi Technology settings will be enabled on the user's computer.
Enable Intel® My WiFi Technology
This setting controls whether Intel® My WiFi Technology is enabled or disabled on the user's computer.
Policy Enforcement
Network Isolation
SSID Name override
Policy Enforcement
Determine when to enforce Intel® My WiFi Technology policies.
Always enforce these policies.
Never enforce these policies
Only enforce these policies when the WiFi adapter is near of one of the following SSIDs:
Add...
Remove
Help?
Close

7. In the left pane, select Allowed Devices. In the right pane, select Allow only the following device types to connect to the Intel® MyWiFi Technology.
8. Click **Add**.

The Add device type dialog is displayed.


Administrator Tool - New Package
File Tools Help
Profiles Application Settings Adapter Settings Intel® MWT Settings Intel® WiDi
Include Intel® My WiFi Technology settings in this package.
Specify which Intel® My WiFi Technology settings will be enabled on the user's computer.
Enable Intel® My WiFi Technology
This setting controls whether Intel® My WiFi Technology is enabled or disabled on the user's computer.
Allowed Devices
SSID Name override
Allowed Devices
Allow only the following device types to connect to Intel® My WiFi Technology
Devices allowed to connect:
Add
Edit
Remove
Help?
Close

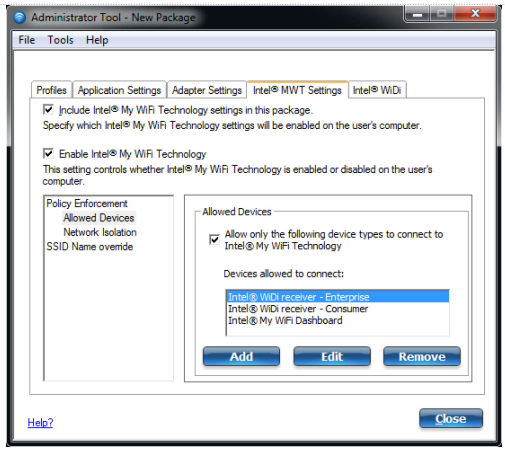
9. In the top drop-down selector, select **Intel® WiDi receiver – Enterprise**. This allows PC clients to connect to only enterprise class wireless displays. Leave the other settings unchanged. Click **OK**.



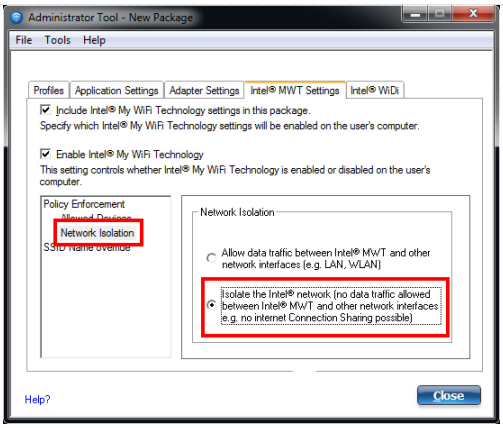
10. Click **Add** again. Another Add device type dialog is displayed. In the top drop-down selector, select **Intel® WiDi receiver – Consumer**. Leave the other settings unchanged. Click **OK**.

11. Click **Add** a third time. Another Add device type dialog is displayed. In the top drop-down selector, select **Intel® My WiFi dashboard**. Leave the other settings unchanged. Click **OK**.

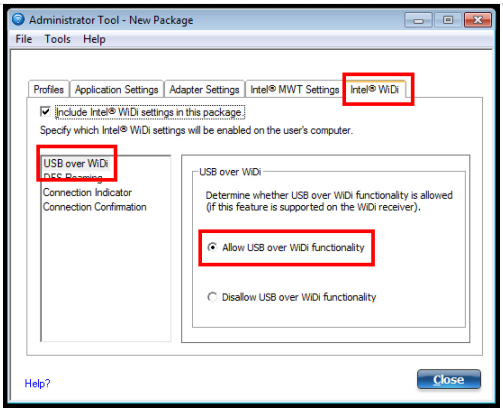
    There should be three entries under **Devices allowed to connect**.


Administrator Tool - New Package
File Tools Help
Profiles Application Settings Adapter Settings Intel® MWT Settings Intel® WiDi
Include Intel® My WiFi Technology settings in this package.
Specify which Intel® My WiFi Technology settings will be enabled on the user's computer.
Enable Intel® My WiFi Technology
This setting controls whether Intel® My WiFi Technology is enabled or disabled on the user's computer.
Policy Enforcement
Allowed Devices
Network Isolation
SSID Name override
Allowed Devices
Allow only the following device types to connect to Intel® My WiFi Technology
Devices allowed to connect:
Intel® WiDi receiver - Enterprise
Intel® WiDi receiver - Consumer
Intel® My WiFi Dashboard
Add
Edit
Remove
Help?
Close

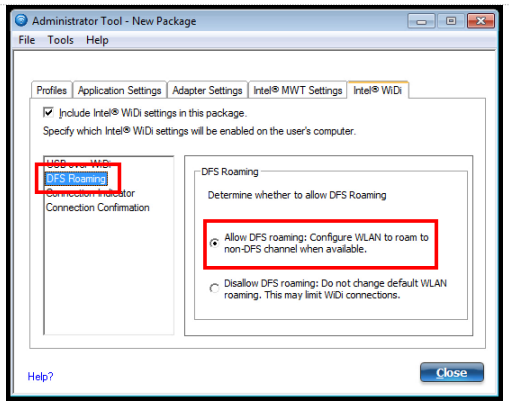
12. In the left-hand pane, select **Network Isolation**. In the right-hand pane, select **Isolate the Intel network...**. This prohibits network bridging between the Intel® MyWiFi personal area network and other network interfaces. Selecting this option prevents Internet Connection Sharing (ICS).
13. Do not make any changes to options under **SSID Name override**.


Administrator Tool - New Package
File Tools Help
Profiles Application Settings Adapter Settings Intel® MWT Settings Intel® WiDi
Include Intel® My WiFi Technology settings in this package.
Specify which Intel® My WiFi Technology settings will be enabled on the user's computer.
Enable Intel® My WiFi Technology
This setting controls whether Intel® My WiFi Technology is enabled or disabled on the user's computer.
Policy Enforcement
Network Isolation
SSID Name override
Network Isolation
Allow data traffic between Intel® MWT and other network interfaces (e.g. LAN, WLAN)
Isolate the Intel® network (no data traffic allowed between Intel® MWT and other network interfaces (e.g. no Internet Connection Sharing possible)
Help?
Close

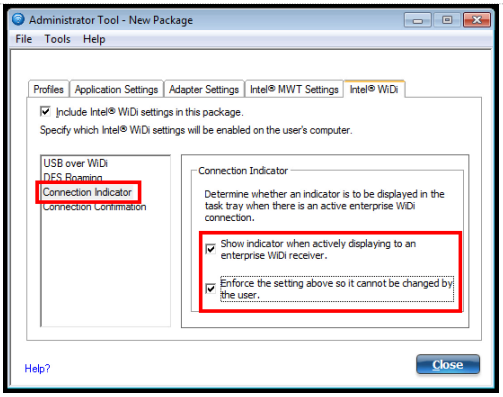
14. Select the Intel® WiDi tab. Select Include Intel WiDi settings in this package.
15. In the left-hand pane, select **USB over WiDi**. In the right pane, select **Allow USB over WiDi functionality**.


Administrator Tool - New Package
File Tools Help
Profiles Application Settings Adapter Settings Intel® MWT Settings Intel® WiDi
Include Intel® WiDi settings in this package.
Specify which Intel® WiDi settings will be enabled on the user's computer.
USB over WiDi
Connection Indicator
Connection Confirmation
USB over WiDi
Determine whether USB over WiDi functionality is allowed (if this feature is supported on the WiDi receiver).
Allow USB over WiDi functionality
Disallow USB over WiDi functionality
Help?
Close

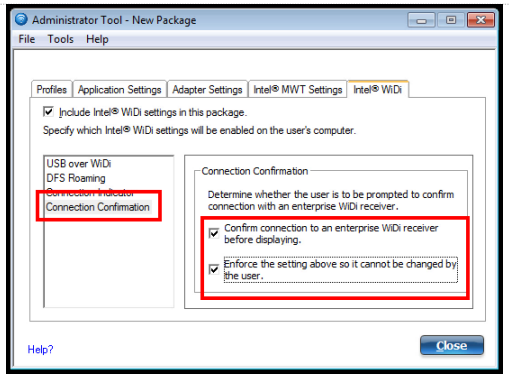
16. In the left pane, select **DFS Roaming**. In the right pane, select **Allow DFS** roaming. See Section 3.3.


Administrator Tool - New Package
File Tools Help
Profiles Application Settings Adapter Settings Intel® MWT Settings Intel® WiDi
Include Intel® WiDi settings in this package.
Specify which Intel® WiDi settings will be enabled on the user's computer.
DFS Roaming
Connection Confirmation
DFS Roaming
Determine whether to allow DFS Roaming
Allow DFS roaming: Configure WLAN to roam to non-DFS channel when available.
Disallow DFS roaming: Do not change default WLAN roaming. This may limit WiDi connections.
Help?
Close

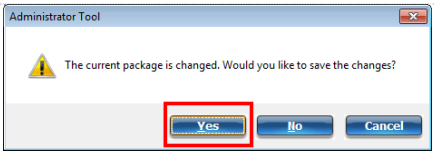
17. In the left-hand pane, select **Connection Indicator**. In the right pane, select both options **Show indicator when …** and **Enforce the setting…**. This ensures that the connection indicator in the taskbar is green and that the user cannot change it, i.e., turn off the indicator.


Administrator Tool - New Package
File Tools Help
Profiles Application Settings Adapter Settings Intel® MWT Settings Intel® WiDi
Include Intel® WiDi settings in this package.
Specify which Intel® WiDi settings will be enabled on the user's computer.
USB over WiDi
DFS Roaming
Connection Indicator
Connection Confirmation
Connection Indicator
Determine whether an indicator is to be displayed in the task tray when there is an active enterprise WiDi connection.
Show indicator when actively displaying to an enterprise WiDi receiver.
Enforce the setting above so it cannot be changed by the user.
Help?
Close

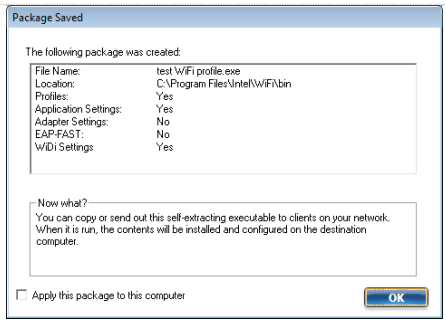
18. In the left-hand pane, select **Connection Confirmation**. In the right pane, select both options **Confirm connection to…** and **Enforce the setting…**.This ensures that the connection must be confirmed before the user's desktop is displayed in the WiDi display and that the user cannot change it.
19. Click **Close**.


Administrator Tool - New Package
File Tools Help
Profiles Application Settings Adapter Settings Intel® MWT Settings Intel® WiDi
Include Intel® WiDi settings in this package.
Specify which Intel® WiDi settings will be enabled on the user's computer.
USB over WiDi
DFS Roaming
Connection Indicator
Connection Confirmation
Connection Confirmation
Determine whether the user is to be prompted to confirm connection with an enterprise WiDi receiver.
Confirm connection to an enterprise WiDi receiver before displaying.
Enforce the setting above so it cannot be changed by the user.
Help?
Close

You are prompted to save the changes.



20. Click **Yes** to save the changes to a new file.
21. In the Save As dialog, enter a name for the new Profile. Do not change the default location. Click **Save**. This creates an executable profile. When the package is written, click **Finished**.
22. In the Package Saved window, a summary of the settings you specified is displayed. Do not select **Apply this package to this computer**.
23. Click **OK**.


Package Saved
The following package was created:
File Name: test WiFi profile.exe
Location: C:\Program Files\Intel\WiFi\bin
Profiles: Yes
Application Settings: Yes
Adapter Settings: No
EAP-FAST: No
WiDi Settings Yes
Now what?
You can copy or send out this self-extracting executable to clients on your network. When it is run, the contents will be installed and configured on the destination computer.
Apply this package to this computer
OK

A self-extracting executable file is created and can be executed on client computers. It configures the client computer with the settings you defined. IT will normally use an Enterprise Management Console such as Microsoft ConfigMgr, Symantec Altiris, BigFix, HP Client Automation, LANDesk or other to deploy this executable.

7 Intel Pro WiDi User Instructions

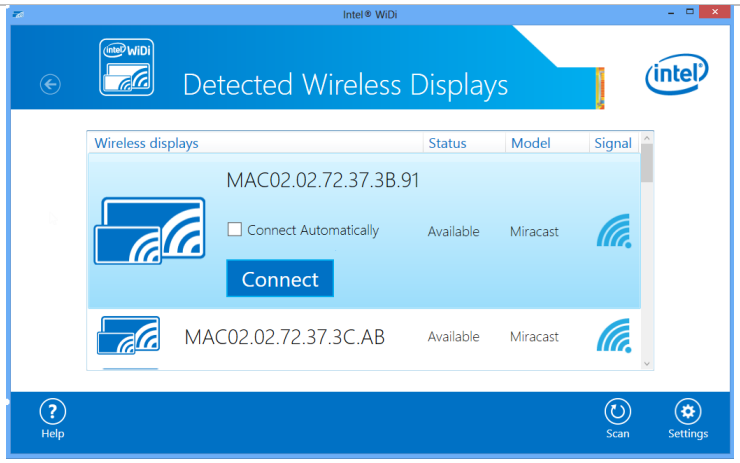
7.1 Connecting to a Wireless Display

The first time you connect to a wireless display, you must "pair" your computer to a wireless display by exchanging a PIN. The second and subsequent connections use the stored pairing information to connect more quickly.

7.1.1 Pairing to a Wireless Display

Use this procedure the first time a computer is connected to a wireless display.

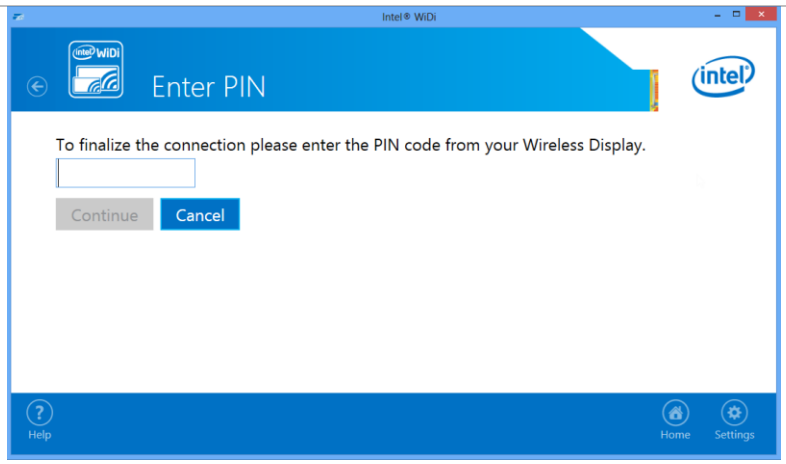
1. Start the Intel WiDi application.
2. In the **Detected Wireless Displays** page, select the wireless display to which you want to connect.



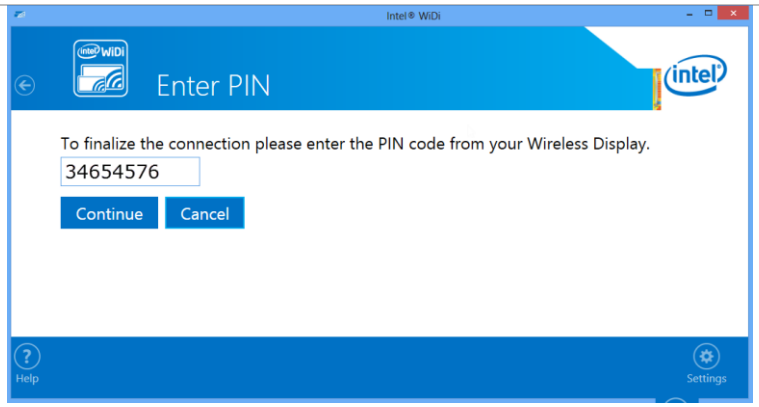
3. Click **Connect**. The wireless display shows an eight-digit PIN. Enter this number in the Enter PIN screen. (The PIN shown is only an example. Your PIN will be different.)

- ***Note:*** *The PIN is used to pair the computer to the specific wireless display.*

- ***Note:*** *The wireless display times-out after approximately two minutes. If the wireless display goes back to the "Ready for connection." screen, you must reselect the display in the application and click* ***Connect****.*

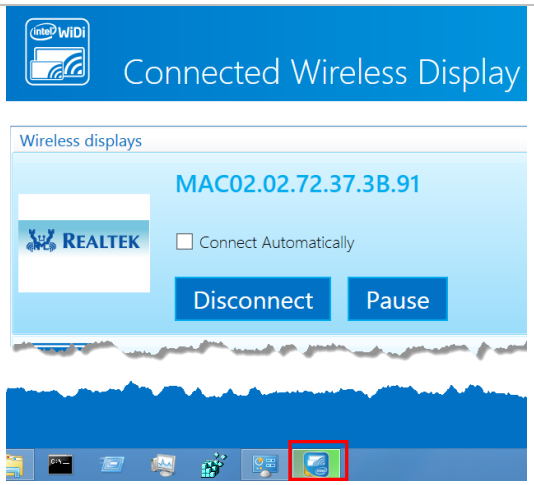


4. Enter the PIN and click **Continue**. (The PIN shown below is only an example. Your PIN will be different.)



5. The wireless display connects with your computer. The Intel WiDi icon in the taskbar turns green to indicate a connected wireless display.

6. When you have finished using the display, click **Disconnect**.



7.1.2 Connecting to a previously Paired Wireless Display

Use these steps for subsequent connections to a wireless display with which the computer has already exchanged a PIN.

1. Start the WiDi application.
2. Identify the wireless display to which you want to connect. Select the row with that display.
3. Click **Connect**.

   The Connection Successful confirmation screen displays. This is also referred to as the Connection Confirmation screen.

   - If you don't see this screen, you have connected to the wrong screen. Click **Disconnect**.
   - If you do see the Connection Successful, click **Share**.
4. When you have finished using the display, click **Disconnect**.

7.1.3 Setting up 5 GHz Operation

Intel Pro WiDi connections are formed using 2.4 GHz Wireless-N by default. In order to ensure connection to an adapter using 5 GHz band, connect the PC's Wireless LAN to a 5 GHz network before launching Intel Pro WiDi. It is NOT possible to connect WiFi to 2.4 GHz and Intel Pro WiDi to 5 GHz simultaneously. The reverse configuration is also not possible.

7.1.4 Using a Wireless Display as an Extended Display

When you connect to a wireless display, by default it is configured as a duplicate display that shows the same screen as your laptop. You may also configure a wireless display to be an extended display by following the instructions below.

1. Go to **Start** > **Control Panel** > **Appearance and Personalization** > **Display** > **Screen Resolution**.
2. On the Display drop-down menu, select the wireless display.
3. On the Multiple displays drop-down menu, select **Extend these displays**.
4. Click **Apply**.
5. Reposition the monitors to suit your needs.

8 Troubleshooting

8.1 Intel Pro WiDi Logging

Use the information in this section to set up logging for Intel Pro WiDi.

8.1.1 Installer Logging

During installation, the Intel WiDi installer creates a MSI Install log and WDL log in the following location:

- C:\Users\<User>\AppData\Local\Temp\MSI<number>.log
- C:\Users\<User>\AppData\Local\WiDiSetupLog.<timestamp>.wdl

8.1.2 Enabling Session Runtime Logging

1. Exit the Intel WiDi application.
2. Launch **Regedit.exe**.
3. Navigate to the Intel WiDi application section by looking for:
   `Computer\HKEY_CURRENT_USER\Software\Intel Corporation\Intel WiDi`
4. Create a new DWORD (32) key named `LogEnable`.
5. Set the value of LogEnable = 1
6. Exit **Regedit.exe**.

Log files are created for each Intel WiDi session, for the duration of the Intel WiDi application being launched, and then is closed. Log files are created immediately after launching the Intel WiDi application and can be opened at any time. Log files are stored in the following location:

`C:\Users\<userID>\AppData\Local`

Log files are named using this format:

`WiDiLog.<date>.<time>.wdl`

8.2 Common Issues

Common issues and resolutions are given in this section. For more detailed troubleshooting steps, refer to the extensive help file provided with the Intel WiDi Software application.

Issue	**The PC Doesn't Seem to be Connecting to the Adapter**
Solutions	• At the PC, verify that WiFi is switched on. • Antivirus / Firewall software may be blocking Intel WiDi software. Add the Intel WiDi application ("widiapp") to the software's white list. • Disconnect from the WiFi network and connect to Intel WiDi without a WiFi connection.

Issue	**Wireless Network Reception is Poor**
Solutions	Best Known Methods (BKMs) • Disconnect and exit VPN and connect to Intel WiDi without a VPN or WiFi connection. • Double check the internet connection speed using 2Wire's speed test or geo-specific equivalent. (http://www.2wire.com/bandwidth/meter.php?kbps=8256.5) • Leave the notebook stationary and refrain from moving it for best wireless reception / performance. 802.11x is not a "mobile" networking technology like GSM or CDMA. • If wireless reception/performance is borderline good, try rotating the notebook 90 degrees and see if reception/performance improves. • The presence of wireless networks during simple SSID (infrastructure) scan doesn't guarantee a channel free from high traffic/interference. Use a spectrum analyzer like the Meta Geek* Wi-Spy* and Chanalyzer Pro* (see Appendix B) to show actual traffic on a given channel/network. Steps to determine if streaming problems are related to wireless interference: 1. Launch and connect to the adapter for Intel Pro WiDi. 2. Use WindowsK+P to select Extend mode. 3. Play the sample video file, *Wildlife*, in Media Player and move that window to the secondary display. 4. From the Primary display launch the task manager by right-clicking on the task-bar and select **Start Task Manager**. 5. Select the Networking Tab. On the lower part of this window there is a list of network connection. The network connection with a consistent activity level will be the PAN network. 6. Monitor the Link Speed (PHY rate) column. 7. If the Link Speed varies but stays above 36Mbps. then you should see no streaming issues. If the Link speed drops under ~24Mbps, you should see streaming issues. Note that if the Link speed falls too low then you will see the green and pink block artifacts.

Issue	**No Video is Displayed on TV**
Solutions	• Check if TV / adapter are powered on. • Check if correct input on TV is selected. • Reset adapter. • Replace adapter.

Issue	**PC Desktop Does not Display on TV**
Solutions	• Verify that the correct security code was entered into the Intel WiDi Software for the adapter you are connecting to. • Reset the adapter. • Verify that the PC screen is set to one of the following supported screen resolutions; 1280x720, 1280x768, 1280x800, 1366x768, 1440x900, 1600x900, or 1920x1080.

Issue	**I can't get a good picture using 2.4GHz**
Solutions	• Try changing the WiFi channel used by Intel Pro WiDi. In general, 2.4 GHz channels 1, 6, or 11 work best. • You can set the network channels using Intel MWT software. Open My WiFi software on the laptop, select **Profiles**, select **Intel Wireless PAN (preset)**, and then click **Edit**. Select the Advanced tab and select the default channel from the drop down. • Use inSSIDer* software (see Appendix B) to determine which specific channel has the least congestion (as defined by the least number of wireless networks on that channel).

9 Conclusion

9.1 Intel Pro WiDi POC management

Intel Pro WiDi is an exciting technology with great potential to improve user experience in the enterprise. As Intel Pro WiDi matures and Pro WiDi Certified adapters become available these potential opportunities can be made available in production deployments. Until then, it will be important to explore what Intel WiDi can provide while managing expectations amongst IT and the user base with respect to what can be delivered today.

Appendix A Known Issues

Issue	Description
DFS Roaming	**Windows 7**: Enable DFS roaming either through the Intel PROSet IT Admin tool, or by creating a registry key, shown below: [HKEY_LOCAL_MACHINE\SOFTWARE\Intel Corporation\Intel WiDi\Enterprise] "DFS Roaming Enabled"=dword:00000001 **Windows 8**: DFS roaming is not yet functional. To avoid DFS errors, set the NIC on the client platform to connect only to 2.4 GHz. This can be accomplished by setting the WiFi NIC to 802.11g.
Stale scan entries	Switching between users can cause stale entries to be cached. The following registry setting prevents stale entries, but as a result the adapter list may not be complete when a scan is performed. The user may need to select scan multiple times to show the available adapters. [HKEY_CURRENT_USER\Software\Intel Corporation\Intel WiDi] "FilterStaleAdapters"=dword: 00000001
Fast Handoff	Fast Handoff requies a "Pro" adaptor and cannot be tested at this time.
Windows 8	Intel Pro WiDi feature support in Windows 8
Windows 8.1	Intel WiDi capability is built into Windows 8.1. Intel Pro WiDi features have not been implemented at this time. Intel WiDi 4.x will not install on Windows 8.1 and the Intel WiDi user interaction is through a "Project" option on the "Devices" charm when swiping-in from the right-hand side.
Antivirus Software	Antivirus applications may block ports required by the Intel WiDi application. When this issue occurs, the Intel WiDi application indicates that it is connecting but never completes the connection. After one to two minutes, the system returns to the "Ready for connection" screen. To prevent this issue, the "WiDiapp.exe" must be added to the list of trusted applications. Here is an example: McAfee* Enterprise HIPS* (Host Intrusion Prevention System) requires the "WiDiapp.exe" to be added to the list of trusted applications.
McAfee LiveSafe* Security Center	McAfee LiveSafe Security Center Version 12.1 has a known issue that blocks TCP Ports used by the WiDi application. This issue is fixed in McAfee LiveSafe Security Center Version 12.8. Upgrade to Version 12.8.

Issue	Description
VPN	The WiDi subnet should be excluded from the VPN routing table. • If **NOT** using the exclude "Local LAN Access" capability, add a static exclusion to "192.168.x.x" in order to support Intel WiDi. ***Note**: This might be considered a security risk and personal firewall settings should be modified to allow only specific ports\protocols on this subnet (ingress\egress).* • If using "Local LAN Access", verify that the VPN client can adjust to new subnets post connection establishment. If the "Local LAN Access" is not dynamic during VPN connection, add a static exception to the routing table and exclude 192.168.x.x. • Cisco AnyConnect* 3.1.04072 now supports dynamic updates to the host routing table. If you are using Cisco AnyConnect, update to 3.1.04072 to avoid VPN issues.

Appendix B External Resources

Go to MetaGeek at http://www.metageek.net/ to obtain tools such as inSSIDer, Wi-Spy, and Chanalyzer Pro.